

Important Questions On Brain, Behaviour and Evolution



Q1. With evolution, a lot of changes were observed in brain size and structure. Given below are vertebrates. Match each vertebrate with their corresponding brain volume-

- a. great apes i. 34.1 cm³**
- b. old world monkey ii. 316 cm³**
- c. new world monkey iii. 89.1 cm³**
- d. Human iv. 1251 cm³**

- A. a-ii, b-iii, c-i, d-iv**
- B. a-i, b-iii, c- ii, d-iv**
- C. a-iii, b-ii, c-i, d-iv**
- D. a-ii, b-i, c- iii, d-iv**

Ans- A

Q2. Given below are some vertebrates. Match each vertebrate with their corresponding number of meninges present in their brain-

- a. Scoliodon i. three**
- b. Uromastix ii. one**
- c. Rabbit iii. two**

- A. a-ii, b-iii, c-i**
- B. a-i, b-iii, c- ii**
- C. a-iii, b-ii, c-i**
- D. a-ii, b-i, c- iii**

Q3. Given below are some statements about functions of the hypothalamus. Which of the following statement(s) are correct about it?

- P. controls ANS**
- Q. produces hormones**
- R. regulate emotional and behavioural patterns**
- S. control body temperature**

- A. P and Q**
- B. Q, R, S**
- C. P and S**
- D. P, Q, R, S**

Q4. Which of the following is not done by glial cells?

- A. Receiving and conducting electrochemical signals.**
- B. Giving metabolic support to neurons.**
- C. Producing insulating sheaths around axons.**
- D. Removing debris after the death of a neuron.**

Q5. Which of the following cells is responsible for myelin formation in the peripheral nervous system?

- A. Astrocyte**
- B. Oligodendrocyte**
- C. Schwann cell**
- D. Microglial cell**

Q6. Match the following-

COLUMN A (cranial nerves)	COLUMN B (origin)
a. Trochlear	i. lateral side of medulla oblongata
b. Abducens	ii. floor of midbrain
c. Vagus	iii. floor of medulla
d. Hypoglossal	iv. lateral side of midbrain

A. a-ii, b-iv, c-i, d-iii

B. a-i, b-iii, c- ii, d-iv

C. a-iii, b-ii, c-i, d-iv

D. a-ii, b-i, c- iii, d-iv

Q. 7 Which of the following comparisons are true?

1. Nerve impulses produce their effects quickly, whereas hormonal responses generally are slower.

2. Nervous system effects are brief, whereas endocrine system effects are longer lasting.

3. The nervous system controls homeostasis through nerve impulses; the endocrine system works through hormones.

4. The nervous system can stimulate or inhibit the release of hormones by the endocrine system.

5. The nervous system includes organs scattered throughout the body; the endocrine system consists of only the pituitary gland, thyroid gland, adrenal gland, and pancreas.

A. 1, 2, 3 and 4

B. 1, 2, 3, 4 and 5

C. 2, 4 and 5

D. 2, 3, 4 and 5

Q.8 What are criteria for population to be in hardy Weinberg equilibrium choose the correct options:-

1. Random mating

2. Natural selection

3. No Migration

4. Small population size

A. 1, 2,3,4

B. 1,4

C. 2,3

D.1,3

Ans- D

Q9. Which of the following statement is true?

- A. Peripheral nerve is similar to smooth muscle in terms of the connective tissue investment.**
- B. Most nerves contain afferent and efferent fibers and thus carry both motor and sensory signals.**
- C. Nodes of Ranvier are most easily seen in cross-section of peripheral nerve.**
- D. None of the above**

Q10. Match the following-

COLUMN A (part of brain)	COLUMN B (respective parts)
a. Prosocephalon	i. pons and medulla
b. Mesencephalon	ii. thalamus
c. Rhombocephalon	iii. corpora quadrigemina

- A. a-ii, b-iii, c-i**
- B. a-i, b-iii, c- ii**
- C. a-iii, b-ii, c-i**
- D. a-ii, b-i, c- iii**

ANSWERS

- 1. A 2. A 3. D 4. A 5. C 6. A**
- 7. A 8. D 9. B 10. A**

SOLUTION

Solution-1

- a. great apes ii. 316 cm^3
- b. old world monkey iii. 89.1 cm^3
- c. new world monkey i. 34.1 cm^3
- d. Human iv. 1251 cm^3

Solution-2

- a. Scoliodon ii. One, protected by single membrane menix primitiva
- b. Uromastix iii. Two, piameter and durameter
- c. Rabbit i. three, piameter, arachnoid and durameter

Solution-3

All the statements are correct regarding the functions of hypothalamus which is mainly the part of diencephalon of forebrain. It helps in controlling ANS (autonomic nervous system). It produces various hormones reach the pituitary gland through portal circulatory system. It helps in regulating emotional and behavioural patterns and also body temperature. Hence, D is the correct option.

Solution-4

Glial cell or neuroglia are the cells present within CNS which helps in phagocytosing foreign and degenerated materials. They also provide metabolic support to neurons and produce myelin sheaths around axon. But they don't initiate or conduct nerve impulses. Hence, A is the correct option.

Solution-5

Schwann cell is responsible for myelin formation in the peripheral nervous system. Schwann cells are also known as neurolemmocytes which forms myelin sheath around peripheral axons. Astrocytes help to regulate external environment of neurons in the CNS. Microglial have immune function. Hence, C is the correct option.

Solution-6

COLUMN A (cranial nerves)	COLUMN B (origin)
a. Trochlear	ii. floor of midbrain
b. Abducens	iv. lateral side of midbrain
c. Vagus	i. lateral side of medulla oblongata
d. Hypoglossal	iii. floor of medulla

Solution-7

Nerve impulses produce their effects quickly, whereas hormonal responses generally are slower. Nervous system effects are brief, whereas endocrine system effects are longer lasting. The nervous system controls homeostasis through nerve impulses; the endocrine system works through hormones. The nervous system can stimulate or inhibit the release of hormones by the endocrine system. All these are correct but statement 5 is wrong because endocrine system also includes other glands too. Hence, A is the correct option.

Solution-8

No migration

Random matting

No mutation and large population size required for harrdy Weinberg equilibrium so ans D is correct

Solution-9

Peripheral nerve is not similar to smooth muscle in terms of the connective tissue investment. Nodes of Ranvier are not easily seen in cross-section of peripheral nerve as they are present quite deeper. Thus, both A and C are false. Most nerves contain afferent and efferent fibers and thus carry both motor and sensory signals. Hence, B is the correct option.

Solution-10

COLUMN A (part of brain)	COLUMN B (respective parts)
a. Prosocephalon	ii. thalamus
b. Mesencephalon	iii. corpora quadrigemina
c. Rhombocephalon	i. pons and medulla

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